Applicants appreciate the issuance of this new non-final rejection in light of the arguments previously made in connection with the last ground of rejection. Applicants also appreciate the obviously more relevant prior art that has been applied to the claims in this latest Office Action. However, for the reasons set forth below, Applicants maintain that the claims pending in this application are patentable over even this more relevant prior art.

The claims of the present application recite a system or method for offering multi-class financial instruments. As noted by the Examiner in citing Parks, a collateralized mortgage obligation (CMO) is one very well-known multi-class financial instrument. Pending dependent claim 18, for example, likewise recites that the multi-class instrument recited in independent claim 17 may be a CMO. Levine, in Table 13 at col. 13, indicates that its electronic financial trading system handles "mortgaged-backed securities," which, however, are not necessarily multi-class instruments.

With the foregoing in mind, it is critical to understand that Applicants are not claiming to have invented selling multi-class instruments generally, selling CMOs in particular, or even selling such instruments over an electronic auction, all of which is disclosed by Levine/Parks. Rather, Applicants have invented and are claiming a new and highly efficient methodology to create, modify, re-modify and sell such instruments in real-time, while eliminating most risks for the underwriter, via an electronic auction--a methodology that is neither rendered obvious or even remotely contemplated by Holdcroft nor capable of being supported by the electronic trading system of Levine.

Holdcroft is cited for allegedly disclosing modifying a structure database in response to bid information and displaying updated financial information. (See page 4 of the Office Action.) Applicants have obtained a full copy of the Holdcroft reference (copy enclosed) and have carefully reviewed the same.

Holdcroft describes the advent of CMOs and their manipulation by computer software that purports to facilitate "the structuring and analysis of mortgage securities." (Holdcroft, p. 16.) Holdcroft also discloses an increasing "demand for CMO structures containing securities with varying allocations of prepayment risk." (Holdcroft, p. 17.) Holdcroft still further discloses that it is desirable to hold few bonds (*i.e.*, collateral) in inventory. (*See* Holdcroft, paragraph bridging pp. 18-19.) All of these facts are acknowledged by the Applicants as being well-known indeed.

Significantly, however, Holdcroft goes on to note that to avoid such undesirable bond inventories, it is necessary to identify potential investors and their preferences "well in advance of underwriting." (Holdcroft, p. 19.) Holdcroft then goes on to explain how personnel at "the Desk" model potential transactions and that "the culmination of their work is a rather elaborate model that presents the user with a series of options, through various structuring pages and menus, that control bond payment characteristics." (Holdcroft, p. 19.) A resulting structure

> is then modified class by class, to meet specific investor demand as closely as possible. The model is manipulated to create variations in average life, stated maturity, extension risk, and call risk through the use of various payment and allocation terms. Ideally, structural options would be examined in a systematic and thorough process. *In reality, the Desk's intuition and a fair dose of luck generally decide the course of review*.

(Holdcroft, p. 20, emphasis added.)

In view of the foregoing, it is evident that Holdcroft describes an attempt to overcome the prior art problem outlined in the Background section of the instant application, namely that investment bankers do not want to be left "holding the bag" of unsold classes of a multi-class instrument. The 15-year-old Holdcroft article, however, merely describes the conventional methodology, albeit using a "wished for" but unspecified computer technology, of attempting to tweak multi-class instrument offerings, ***prior to actual offering***, in the hope that, when offered, investors will indeed be willing to buy up all of the offered instruments. However, Hodlcroft offers no methodology for this computer technology. Holdcroft purports to "tweak" the various investment classes, but offers no logical way to do this. In fact, Holdcroft (page 20) states "[i]n reality, the Desk's intuition and a fair dose of luck generally decide the course of review" of investment classes. This approach depends on luck, not a systematic process in accordance with the claimed invention.

Turning back to Levine for a moment, that reference discloses a relatively unsophisticated, well-known, financial trading system that contemplates offering, for auction, various financial instruments (though not necessarily multi-class instruments), as noted above. Thus, a combination of Holdcroft and Levine would not result in a system as in the claimed invention. Specifically, there is no methodology in Levine or Holdcroft to modify the investment classes of multi-class instruments. Holdcroft only says that it is desirable to do so (this is common knowledge), but offers no methodology to accomplish this. Any system derived

by combining Levine and Holdcroft does not function in accordance with the claimed invention for at least three reasons.

First, claim 1, for example, requires, among other things, that the system operate to (i) display class information related, respectively, to each class of the multi-class instrument, (ii) receive bid information, (iii) modify the structure database in response to the bid information and display updated class information, and (iv) notify the underwriter of an amount of underlying collateral to purchase in view of the bid information received.

Thus, in the instant invention, bids come in and then, in response to those bids, other classes are modified by the computer and redisplayed in real time, and, still later, the underwriter is notified of the amount of collateral to purchase in view of the bid information received. In other words, in accordance with the present invention, changes to the structure of the classes of the multi-class instrument occur in the midst of the auction itself. This feature of the invention is emphasized, for example, by dependent claim 10, which requires responsiveness to be no longer than 120 seconds. Such responsiveness is not at all contemplated by the Holdcroft system, which, admittedly, does not examine in a "systematic and thorough process" the structures that have been modeled, and again, offers no methodology to modify investment classes. The personnel at "the Desk" are always going back to remodel for *future* offerings, and hoping for "a fair dose of luck." The present invention, in contrast, operates in real-time, with present bids immediately impacting present offers of other classes, all in the same auction.

Independent claim 14 recites a much more detailed version of the "on-the-fly" modification of another class of a multi-class instrument "based on" an earlier bid for a different

class offered and an initial offer price and offer amount. Holdcroft simply does not disclose this feature of the present invention, and Levine's trading system, even though it can offer a single class of a multi-class instrument (after the underwriting is completed), does not disclose anything of this sort. Independent claims 17, 21, 25 and 30 recite similar subject matter.

Second, and in a similar vein, a combination of Levine and Holdcroft results in a system that has no need to "notify the underwriter of an amount of underlying collateral to purchase in view of the bid information received." (See, e.g., claim 1.) The presently claimed invention can not only modify prices and structures of classes, but it can also modify the amount of collateral to be purchased, and does so all in real time or "on the fly" -- i.e., in view of received bid information. Holdcroft is completely silent on modification of class structures in the midst of an auction. It follows, therefore, that Holdcroft cannot change an amount of collateral to be purchased in the midst of an auction either, and, as such, there is simply no need for a notification of an amount of underlying collateral to be purchased in view of received bids. The amount of collateral is already previously set in Hodlcroft, and nothing in Holdcroft suggests that it can be changed.

Third, claim 1, as well as several of the other independent claims, recites that the "collateral is purchased only after commitments are received to invest" in the offered classes. This limitation further emphasizes the temporal nature of the instant invention. In operating in this fashion, the present invention does not suffer from the problem of "holding the bag" of unsold classes. Even Holdcroft's "class by class" modification (again, no methodology is identified to accomplish this modification) only results in meeting "investor demand as closely

as possible." In contrast, in the present invention, investor demand is expressly and typically exactly met and only then is the underlying collateral purchased. This is a fundamental difference between the instant invention and the cited prior art.

The Office Action cites to two passages of Levine that purport to disclose how collateral is purchased only after commitments are received. (See paragraph bridging pp. 5-6 of the Office Action.) However, these passages disclose only how preset rules may be implemented when monitoring the Levine auction, and say nothing about obtaining buy *commitments* for classes of a multi-class instrument prior to purchasing the underlying collateral for those classes.

In the past, Applicants' attorney has focused especially on pending claim 30 as being representative, in many respects, of the instant invention. Reviewing that claim again, it can be seen that it requires "matching" bids, conducting price and amount equalization in view of the bids, and "re-matching" investor bids with the equalized price and amount. As discussed above, while Holdcroft purports to poll the market and tweak class by class, Holdcroft actually does not disclose any methodology for doing this. More importantly, it would be impossible for the Holdcroft system to do so in the midst of an actual offering. In other words, Holdcroft does not disclose "matching" and "re-matching" bids as is recited by claim 30.

Again, Holcroft (page 20) states "Ideally, structural options would be examined in a systematic and thorough process. *In reality, the Desk's intuition and a fair dose of luck generally decide the course of review.*" (Emphasis added.)

In the present invention, the computer polls the bids for various investment classes, modifies the other classes in response to the bids received, and thereby removes the "intuition

and luck" (as in Holdcroft) of the underwriter from the equation, while at the same time eliminating most of the risks for the underwriter. The present invention also clearly and specifically defines all characteristics of all investment classes of the multi-class instrument in real-time, at all times during the underwriting process. This possibility is not even contemplated by Holdcroft.

Furthermore, Holcroft and Levine have existed since 1988 and 1998, respectively. Investment firms are constantly searching for business processes that eliminate risk, while furthering their businesses. If, combining of Holdcroft and Levine would "obviously" lead to the present invention, surely the "bulge bracket" Wall Street firms, with almost unlimited capital, human, and technology resources, would have already developed a system utilizing the present invention. To the best of Applicants' knowledge, no such system exists.

In view of all of the foregoing, Applicants urge the Examiner to reconsider the rejection set forth in the Office Action mailed January 4, 2006, and allow claims 1 and 3-30.

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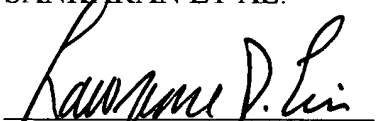
Respectfully submitted,

SANKARAN ET AL.

Date: June 26, 2006

By: 

Lawrence D. Eisen
Registration No. 41,009

Attachment: Full copy of cited Holdcroft reference

LDE/dkp

Customer No. 00909

The Wizards of Wa

Does it take wizardry to devise complicated multiclass mortgage securities, or just the right mix of technology and determination? A look behind the curtain can be revealing.

by James P. Holdcroft, Jr., and Edward L. Neuburg

Just a few short years ago, Freddie Mac and First Boston collaborated on the first Collateralized Mortgage Obligation (CMO). Since that multiclass mortgage security was issued, hundreds of billions of dollars of CMOs and Real Estate Mortgage Investment Conduits (REMICs) have followed. But many of these issues are structured quite differently from the original. In fact, Wall Street's wizards seem to be devising ever more complicated structures for these securities, sometimes creating the impression that they have powers beyond the ken of mere mortals.

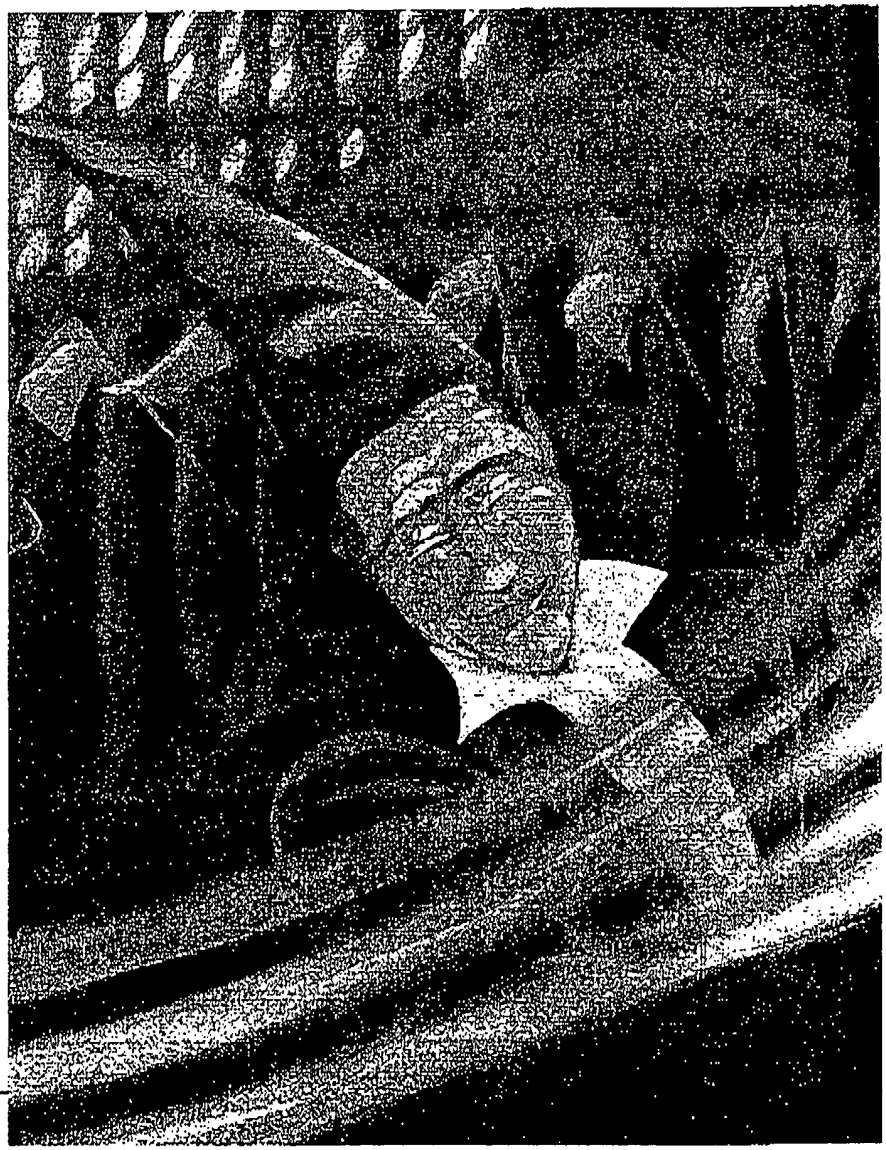
If one looks behind the wizard's curtain, however, much of the mystery disappears. Technological advances in the process of allocating cash flows and in the computer power that makes it possible have been the driving force behind the multiclass mortgage security market. With the new technology, the wizards do not need magical powers: by pressing a few buttons, they can quickly create new structures simply by combining bonds in new ways.

The first CMO was a technological breakthrough in its day, and its basic concept—prioritizing the principal payments on the underlying mortgages to certain classes of bonds—continues to be the cornerstone of CMOs and REMICs. By today's standards, however, it seems extremely simple. Today's REMICs incorporate a number of complex rules that produce a wider variety of bonds, which makes analyzing bond characteristics much trickier.

Technology has made this increased complexity possible through the truly remarkable development of computer software that facilitates the structuring and analysis of mortgage securities. The original CMO analytical models were generally deal-specific (that is, each deal had its own distinct model) and difficult to modify. In contrast, today's models can not only evaluate a wide variety of existing structures, but enable financial engineers to combine bond classes with varying characteristics to produce innovative structures. Indeed, the ease with which the building blocks can be combined in these new analytical models may be what generates the majority of structural innovations.

Most, if not all, developments in CMO/REMIC technology derive not from the competitive one-upmanship of Wall Street "rocket scientists," but rather from the ongoing effort to create securities that investors value most highly. Competition to show issuers the best possible transaction (the highest price for collateral or, if they want to retain the residual, the residual class that best meets their investment requirements) keeps this motivation in sharp focus.

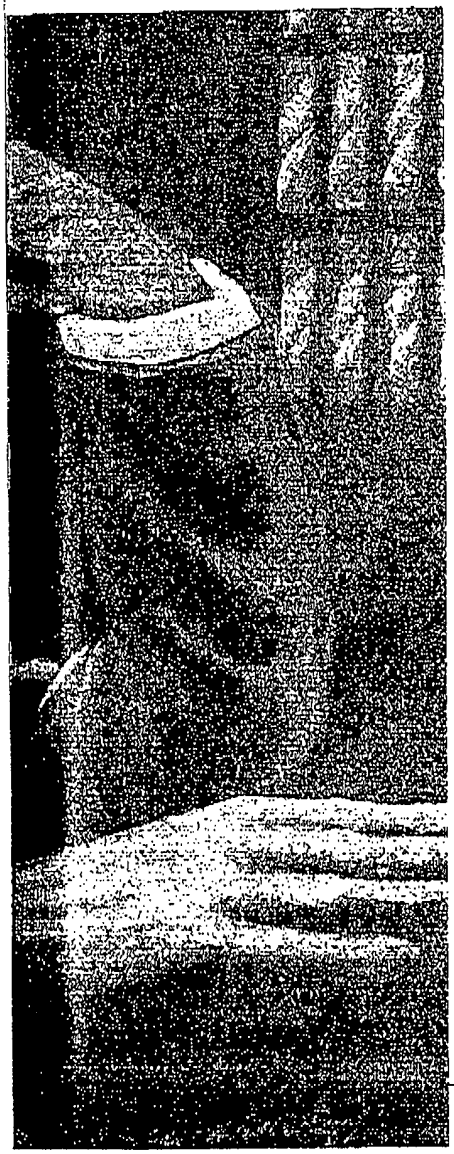
As investors have become more sophist



James P. Holdcroft, Jr., is a director and Edward L. Neuburg is an associate at The First Boston Corporation.

Street

cated and knowledgeable about mortgage prepayment behavior and how it affects various types of securities, the demand for more specialized mortgage securities has grown. In particular, greater understanding of the option characteristics of mortgages has generated demand for CMO structures containing securities with varying allocations of prepayment risk. Today, CMO structurers spend considerable effort apportioning "extension risk" (the risk that a security will exceed its expected average life) and "call risk" (the risk that a security will fall short of its expected average life) among the various classes. At the same time, competition from new entrants—investment banks, commercial banks, and financial intermediaries—puts more pressure to respond to investor demands on those wishing to structure and underwrite mortgage securities.



The initial Freddie Mac CMO stands out as a leap of imagination; nothing in the subsequent development of CMOs and REMICs rivals it in terms of creativity or impact on the market. The technological development of CMOs and REMICs since then has been a history of small steps rather than giant leaps, with perhaps a few hops here and there. Nevertheless, the cumulative changes in the way CMOs are structured and sold are indeed significant. As a result, the process of creating a viable CMO or REMIC issue today is quite different from those first CMOs.

Evolution of the CMO Team

In the early days of CMOs, issuers, lawyers, accountants, and investment bankers worked together to structure a transaction, draft an indenture and offering circular, and file a registration statement. This work took several weeks, and product development and execution took place simultaneously. In most cases, the group considered and resolved structuring and marketing issues at one of many drafting sessions. The CMO structuring process was very similar to that of structuring a traditional corporate bond or debenture prior to Rule 415 shelf registrations. But the process was more difficult for CMOs because of the complexity of the bonds being issued and the constant development of new structures.

As CMOs and REMICs became more complicated and competition increased, most issuers and investment bankers realized that these securities could no longer be handled as discrete or "one-time" transactions. Expenses, accounting considerations, and the need for greater agility in bringing transactions to market fueled changes in the structuring process.

Issuers became increasingly disenchanted with the time and expense required to develop and maintain in-house expertise for structuring and servicing the latest bond innovation. The expense involved in keeping a registration statement up to date was annoying, too.

As the size of the "average" transaction began to exceed $200 million, the demand for off-balance-sheet vehicles grew as well.

As the market developed, issuers also found that effective participation demanded greater agility. Prices for mortgage securities such as Freddie Mac Participation Certificates (PCs), Fannie Mae Mortgage-Backed Securities (MBSs), and Ginnie Maes became more responsive to market shifts. Thus, the price paid for the collateral began to reflect most, if not all, of the so-called arbitrage profits from issuing multiclass securities. Nevertheless, opportunities to issue CMOs and REMICs appeared from time to time, especially when markets were volatile. More important, issuers came to realize that firms capable of rapidly modifying existing structures could produce new arbitrage profits not captured by existing prices for mortgages.

Investment bankers responded to market changes and the needs of issuers. They developed generic issuing vehicles, often bearing their own names, flexible enough to accommodate the requirements of many clients within one registration statement. The concept was dubbed "rent-a-shelf" (a takeoff on the SEC's Rule 415 shelf registration rules). Using a rent-a-shelf, issuers could sell mortgage collateral to an investment bank for use in a CMO or REMIC issued by the investment bank's special-purpose subsidiary or sponsored trust.

Then, in late 1985, First Boston and other Wall Street firms developed specialty teams to focus exclusively on multiclass mortgage securities. The objective was to exploit the newly created rent-a-shelf vehicles more efficiently, and to keep their documentation abreast of market changes. These teams comprised experts from several different disciplines within the firm. Typically, they included computer programmers, financial engineers, finance generalists, lawyers, accountants, mortgage capital markets officers, salesmen, and mortgage traders. As the art/science of structuring and marketing CMOs (and later REMICs) advanced, specialists in analyzing and selling residual interests were added to the team.

Today, the successful structuring of a CMO or REMIC requires the interaction of a dozen or so individuals with diverse skills and experience before the would-be issuer

A Look Behind the Curtain

In practice, the steps leading to pricing of a CMO or REMIC are like a series of go/no-go tests. Failure at any point can set the process back several steps or cause a particular transaction to be abandoned. Few transactions proceed in the uninterrupted linear fashion described below.

Customer Inquiry

The process begins with a customer request for a price indication on a block of collateral, or for a certain type of CMO or REMIC class or a residual with specific investment performance characteristics. For example, Customer X asks its salesperson for a price indication on $150 million of Freddie Mac PC 10s and expresses interest in swapping the PCs for a security with a 5-year average life and near-mortgage yield. At the same time, Customer Y calls seeking a bearish residual to add to its existing portfolio of residual investments. The salespeople immediately inform the Desk.

Initial Survey

Customer X's request is common enough that the Collateral Trading Desk could give a price indication, and the CMO Trading Desk could explore the availability of existing mortgage securities meeting Customer X's investment parameters. But to the Desk, the request for a bearish residual is more interesting. The residual market is thin and evanescent, and a firm order from a reliable customer can drive a whole transaction.

The Desk's first step toward structuring a deal is to poll the Trading Desks and Capital Markets to get a feel for the market. Because bearish residuals tend to be small in relation to the size of the deal, the issue may need to be at least $500 million to meet Customer Y's desired investment size and achieve the economies of scale of a larger transaction. Therefore, Customer X's $150 million of PC 10s will not be enough. The Collateral Trading Desk provides immediate feedback on PC 10 price levels and the availability of an additional $350 million of collateral. The CMO Trading Desk furnishes secondary market color and its assessment of required primary market yields. Capital Markets gives information on competing products, yield levels, and overall market tone. If the indications are positive, the Desk moves into a structuring mode.

Structuring Mode

In fact, the Desk is continuously in this mode, either working on other reverse inquiries, reverse engineering competitors' transactions, or developing new twists on old structures. When there is a specific inquiry, the Desk focuses on that. The first step is to fit the PC 10s into the most favored current structure. If that structure includes a new twist or an adaptation of a competitor's innovation, the financial engineers from Product Development will be called in to modify the structuring model and certify the computational soundness of its new capabilities. With structures in hand, the Desk begins negotiations.

Negotiations & Premarketing

The Desk first revisits collateral availability and price—eighths and 32nds of a percent add up quickly on large transactions. If after several iterations the transaction is still profitable to all parties, premarketing is considered.

Premarketing is essential to the successful distribution of any security. If premarketing proves that there is active investor interest for the bonds, the degree of "price talk" intensifies and feedback to the Desk increases.

This orderly progression can be brought to a sudden halt by abrupt changes in the market: investor interest can vanish; competitors may saturate the market with CMOs, REMICs, or other competing instruments; collateral may become scarce or expensive; or required CMO and REMIC yields may rise. But if all is well, a pricing date is set for the transaction and the Desk moves to the next round of more intense negotiations—pricing.

Pricing

To outsiders, pricing can seem chaotic,

is contacted. Once contact is made, the CMO team expands dramatically to include several finance representatives of the client, additional attorneys, and accountants.

The Desk as Quarterback

A subgroup of the CMO team is responsible for monitoring the market for potential opportunities. This group, known officially at First Boston as the "Mortgage Markets Group" and colloquially as the "Desk," talks continually with other members of the team.

The Desk is the CMO team equivalent of the quarterback. It meets with capital markets representatives to monitor the supply of competing new issues—usually other CMOs and REMICs, high-grade corporate debt, and asset-backed securities. The Desk meets with the firm's economists to ascertain the likely mood in the markets and the direction of interest rates. It stays in constant touch with mortgage traders to keep up with prices and the supply of mortgage collateral. The Desk also discusses prepayment speeds and prepayment projections with representatives of the Fixed Income Research Group (specialists at evaluating and pricing non-equity securities) when it appears that a transaction may be close.

In most instances, the Desk focuses on no more than three coupons (for example, 9s, 9.5s, and 10s) at any one time. Generally, but not always, it evaluates PCs and MBSs simultaneously because what works for one generally will work for the other. Ginnie Maes, on the other hand, are usually monitored separately.

Perhaps the most important and demanding job that the Desk undertakes is fielding inquiries from the hundreds of salespeople whose customers express interest in various mortgage securities. If a customer has even a remote interest in purchasing a particular type of security that could possibly be structured as a class of a CMO or REMIC, a salesperson will do everything short of taking out an advertisement in the local paper to make certain that the Desk is aware of such interest and working to satisfy it.

Residuals

Following the unfortunate experience of a number of firms that neglected to hedge volatile components of mortgage securities,

disorganized, and perhaps even anticlimactic. It can also be sobering, for in a matter of minutes significant commitments are made and large potential risks are assumed.

The Desk often finds itself at the center of the maelstrom. Uncontrollable market variables, which cause small adjustments to bond prices and yield spreads to Treasuries, keep everybody focused. Prepayment speeds are verified with Fixed Income Research and compared to those of other participants in the market. Collateral prices are checked. If market conditions are right and the Trading Desks, Capital Markets, and New Issue Marketing all concur that the risk is within acceptable parameters, final capital commitment approval is obtained, a collateral offer is made and accepted, and the bonds are priced and offered to investors.

Post-Pricing

Pricing marks the Desk's exit from the process. The Account Team assumes the active role. It coordinates the distribution of final marketing materials, contacts the lawyers to begin preparing public offering documents, initiates production of the calculations required for the offering documents, and provides these calculations to accountants for independent verification. Once the offering documents are ready, the Account Team monitors and coordinates the allocation of collateral, the settlement of the bonds, and the sale and settlement of the residual. The Desk, its part concluded, goes behind its curtain and begins to work on the next inquiry, or the latest structure, or simply picks up where it left off before pricing. ■

issuers and investment bankers developed a strong preference for distributing new issues quickly and holding few bonds in inventory. This requires identifying potential investors and their preferences, especially for very volatile residual class bonds, well in advance of underwriting. Residuals were originally structured as simply what was left over after paying debt service on the bonds; today they are highly engineered to meet the specific investment criteria and interest rate outlook of one or more buyers.

In many instances, the residual is, in fact, the focus of the structure and the regular class bonds are simply a byproduct. This marks a dramatic change in the market. Before floating-rate classes and other structural improvements appeared in late 1986, most residuals were small in relation to the bonds and had "bearish" return characteristics, a Wall Street term of art for instruments whose performance improves when interest rates rise. Although this characteristic made residuals attractive only to sophisticated investors with strong convictions on the direction of future interest rates, high initial yields created demand for bearish residuals. Increased CMO volume, and accounting restrictions on the percentage of a CMO's residual that an issuer or investor could own without consolidating the associated debt, rapidly created a need for a secondary market.

The marketplace soon moved beyond the bearish residual. New structures generated residuals that responded in different ways to movements in interest and prepayment rates: "bullish" residuals that performed well in falling interest rate environments, and "humped" residuals that did best when interest rates remained unchanged. Like bearish residuals, humped and bullish residuals appeal to sophisticated buyers as part of their overall investment portfolio strategies. Only iron-nerved, risk-seeking investors will hold residuals unhedged.

Because residual buyers are scarce, an issuer that does not want to own the residual must design a REMIC or CMO so that its residual has the size and expected payment characteristics that a few reliable customers demand. In most instances, residual investors will specify collateral type, coupon, weighted average maturity (WAM), and the minimum desired pre-tax rate of return on investment for various interest rate scenarios. Typically, these analyses assume instantaneous shifts of interest rates of plus and minus 100, 200, 300, and 400 basis points (see figure 1).

Modeling the Transaction

Armed with all of this information, the Desk begins modeling a transaction. The efforts of a long line of financial engineers and computer programmers have greatly simplified this potentially time-consuming process. The culmination of their work is a rather elaborate model that presents the user with a series of options, through various structuring pages and menus, that control bond payment characteristics.

These options include a selection of "standard" types of bonds. Of course, what is "standard" changes at least as quickly as the Product Development Group and financial engineers can invent, program, and test these new structures. The current menu includes the structures shown in figure 2. Reverse TACs and "put" options, guaranteeing the stated final maturity of a bond class, are the most recent additions. Of course, these bonds may be combined to create classes that have payment characteristics not intuitively apparent to the normal mind.

In recent months, in fact, the bulk of innovation in CMO technology has come from the creative combination of various bonds in one issue rather than the invention of "new" bonds per se. For example, Freddie Mac's Series 15 REMIC pioneered the combination of TACs and PACs within one issue, an innovation that was repeated in the Freddie Mac Series 16 REMIC and in others thereafter. The ability of CMO models to combine various bond types quickly into a single issue is driving technological development today. The flex-

Figure 1

Sample Investment Performance Analysis

Scenarios		Cash Flow Yield (percent)			
Instantaneous Yield Shift (basis points)	Projected Prepayment Speed (PSA)	Class A (PAC)	Class B (PAC)	Class C (PO)	Class D (Residual)
+400	105	9.34	9.85	7.15	17.52
+300	120	9.35	9.87	7.18	17.00
+200	140	9.36	9.87	7.23	16.31
+100	150	9.37	9.87	7.26	15.96
0	185	9.38	9.87	10.10	9.00
−100	290	9.38	9.86	33.90	−2.93
−200	390	9.38	9.83	51.95	−5.33
−300	510	9.38	9.80	72.85	−8.19
−400	610	9.37	9.78	90.20	−10.60

Figure 2
A Sampler of Current Structuring Practice

- Simple Fixed-Rate Bonds
- Accrual Bonds (Z Bonds)
- Floating-Rate Bonds Indexed to LIBOR, Cost of Funds, etc.
- Reverse Floating-Rate Bonds
- Interest-Only Strips (IOs)
- Principal-Only Strips (POs)
- Super POs
- Planned Amortization Classes (PACs)
- Targeted Amortization Classes (TACs)
- Reverse TACs
- Guaranteed Maturity or "Put" Bonds

ibility that these models provide expands exponentially as the number of classes included in an issue increases. Currently, most Wall Street CMO models can handle more than a dozen bond classes, each with its own payment characteristics, in a single issue.

Surveying the Market and Reverse Engineering

The CMO structuring process generally begins with a review of the most recent deals. The adage that nothing succeeds like success applies to the securities business generally, and to structuring CMOs and REMICs in particular. Often the best structure for a transaction is simply a repeat of the last issue sold, because the demands of the investor base tend not to change radically over short periods of time. Moreover, marketing one deal often generates additional interest in a particular type of security. Just as important, a review of current transactions provides the best information about classes that were not particularly well received by investors.

The review continues with what is generally referred to as "reverse engineering" the issue. This simply means modeling the transaction as precisely as possible. This task is complicated because specific weighted average coupon (WAC) and WAM information for the collateral is lacking until some time after the bonds are priced. In fact, the specific collateral information becomes available only after the collateral for the CMO or REMIC has been allocated by the underwriter and the bonds have been settled. Fortunately, most issuers and underwriters have made a concerted effort in recent years to provide accurate and complete collateral information to investors and Wall Street firms as soon as possible.

Once the transaction has been modeled and the Product Development Group is assured that any new twists have been mathematically verified and programmed correctly, the Desk updates Treasury and bond prices as appropriate and obtains new prices for the mortgage collateral. If the structure is being reviewed for several different coupons or types of collateral, prepayment assumptions are revised at the same time. In setting a prepayment speed assumption, First Boston starts with the opinion of Fixed Income Research, but also considers the views of other firms that are active in the market. All these competitors recognize that variations in prepayment assumptions can turn a mediocre idea into a major transaction, or turn a profitable, highly salable structure into a loss.

The ability of CMO models to combine various bond types quickly into a single issue is driving technological development today.

The structure is then modified class by class, to meet specific investor demand as closely as possible. The model is manipulated to create variations in average life, stated maturity, extension risk, and call risk through the use of various payment and allocation terms. Ideally, structural options would be examined in a systematic and thorough process. In reality, the Desk's intuition and a fair dose of luck generally decide the course of review.

Negotiating Your Way to Pricing

When the full menu of optional structures has been exhausted, the Desk's real fun (or work) begins. Negotiation with each of the constituent groups (at this stage, Capital Markets, New Issue Marketing, and the Trading Desk) is the first order of business. A few 32nds in price for collateral, or 5 or 10 basis points in yield for a particular bond class, can significantly alter the overall economics of an issue. Like most negotiations, however, the game includes considerable posturing, positioning, and counter-offering. Occasionally, this jostling of the market causes enough movement on all sides to allow a mutually beneficial transaction to go forward to pricing. Most times it does not.

If the negotiations prove fruitful, the Desk redirects its attention to the computer model and begins the process of true experimentation. Helped by a keener sense of the market, the Desk tinkers with the terms of the various classes. It first focuses on the classes that seem particularly cheap and on larger classes, because they have the greatest impact on overall economics.

Although this process sounds relatively straightforward, it requires both considerable intuition and determination. An educated hunch gets things off in the right direction, but only repeated iterations can produce the appropriate structure. Thomas Edison's view of genius has a direct application here: the process is one percent inspiration and 99 percent perspiration.

When all else fails, the Desk and the Product Development Group put their heads together and consider how to modify the existing structure even further so that the bonds more closely resemble what the market wants. This confluence of theory and market is what produces the most seemingly novel of securities.

But it is rare that something truly unique is created; more typically, a structure is unique only in its context. For example, floating-rate bonds had been around for years before the first floating-rate class of a CMO was issued. Although PACs and TACs were heralded as new inventions, they employ sinking-fund concepts that have been used in countless billions of dollars of corporate and municipal debt securities. That they spring from other sources does not diminish the significance of these new applications, but it is important to place them in their proper perspective.

CMOs and REMICs have become extremely complicated securities. That does not mean, however, that they are now magical creations, beyond our comprehension. Recognizing that most innovations are simply small adjustments or new combinations of existing structures transforms naive awe into a healthy appreciation of what technology and teamwork can do. SMM